Bangalore Electricity Supply Company Limited

(Wholly owned by Government of Karnataka Undertaking)

TECHNICAL SPECIFICATION FOR 11 KV DROP – OUT FUSE CUTOUTS (DOLO)

1. SCOPE

This specification covers outdoor, open, drop-out Fuse Cutouts suitable for installation in 50 Hz, 11 KV distribution system.

2. APPLICATION

The distribution fuse cutouts are intended for use in distribution transformers and have no inherent load break capacity.

3. APPLICATION STANDARD

Unless otherwise modified in this specification, the cutout shall conform to IS: 9385 (Part – I to III) as amended from time to time.

4. RATED VOLTAGE

The rated voltage shall be 12 kV.

5. RATED CURRENT

The rated current shall be 100 A.

6. INSULATION LEVELS

6.1 RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE VALUES FOR THE FUSE BASE

The rated lightning impulse withstand voltages both for positive and negative polarities shall be given below:

a) To earth and between poles : 75 kV (Peak)

b) Across the isolating distance of fuse base : 85 kV (Peak)

6.2 RATED ONE MINUTE POWER FREQUENCY WITHSTAND VOLTAGE (DRY AND WET) VALUES FOR THE FUSE BASE

A) To earth and between poles : 28 kV (rms)

B) Across the isolating distance of fuse base : 32 kV (rms)

7. TEMPERATURE RISE LIMIT (In Air)

a) Copper contacts silver faced	65^0 C
b) Terminals	50^0 C
c) Metal parts acting as springs	The temp. or temp. rise shall not reach such a value that elasticity of the metal is changed.

8. RATED BREAKING CAPACITY

The rated breaking capacity shall be 8 kA (Asymmetrical).

9. GENERAL REQUIREMENTS / CONSTRUCTIONAL DETAILS

9.1 The cutouts shall be of single vent type (downward) having a front connected fuse carrier suitable for angle mounting.

9.2 All ferrous parts shall be hot dip galvanized in accordance with the latest of IS: 2632. Nuts and bolts shall conform to IS: 1364. Spring washers shall be galvanised.

9.3 Typical constructional details of the fuse cutout are shown in enclosed drawing. (Drg No.BESCOM/GM(QS&S)/20 Rev-002 Dated: 24-11-2018

The **fuse tube** shall be made of fibre glass coated with ultraviolet inhibitor on the outer surface and having arc quenching bonefibre liner inside. The tube shall have high bursting strength to sustain high pressure of the gases during fault interruption. The inside diameter of the fuse tube shall be 17.5 mm. The solid cap of the fuse carrier shall clamp the button head of the fuse link, closing the top end of the fuse tube and allowing only the downward venting during fault interruption.

10. TYPE TESTS

The type test certificates in respect of the DOLO cutouts offered with the fuse unit shall be got type tested at CPRI or any other NABL accredited laboratories for the following type tests along with the bid;

i) Dielectric tests (rates impulse withstand and rated one minute power frequency withstand test voltages)

ii) Temperature rise test

The above tests shall be carried out in accordance with IS:9385 Part I & II

For Porcelain Fuse Base Only

iii) Beam strength of porcelain base

For Fibre Glass Tube

iv) Type test certificates for fibre glass tube shall be submitted.

11. MOUNTING ARRANGEMENT

11.1 The cutouts shall be provided with a suitable arrangement for mounting these on 75x40 mm or 100x50 mm channel cross arm in such a way that the center line of the fuse base is at an angle of 15^0 to 20^0 from the vertical and shall provide the necessary clearances from the support. Mounting arrangement shall be made of high strength galvanized steel flat and shall be robust enough to sustain the various stresses encountered during all operating conditions of the cutout. For more details see enclosed figure 2.

11.2 Strength of the component marked 1 (see figure) shall be determined by clamping the member with the shorter leg at the top to a rigid support by M-10 carriage bolts. A downward force shall be applied along the axis of M-14 carriage bolt parallel to the longer leg and in the direction of longer leg of the member under test. A load of 50kg shall be applied and then removed to take up any slack in the mounting arrangement before the measurement of position is taken, the permanent set measured at the axis of the M-14 carriage bolt shall not exceed 1.6 mm when a load of 425kg is applied and removed.

11.3 The strength of the M-14 bolt shall in no case be less than 1900 kg and strength of M-10 bolts not less that 3500 kg.

12.0 SOLID CORE INSULATOR

12.1 The insulator used shall be of 11kV solid core type, brown glazed porcelain suitable for highest system voltage of 12 KV. The Insulators shall generally conform to IS: 5350 (part-II) and as per the enclosed drawing No: BESCOM/GM/CP/29 Dated: 24.10.07.

12.2 The insulator shall be in one piece. The stresses due to expansion and contraction in any part of the insulator shall not lead to its deterioration. The insulator shall be glazed effectively on all the surfaces except for the parts on which the particulars are supported during firing which may be left unglazed. The solid core insulator shall be baked in Temperature controlled kilns only.

12.3 Insulators shall pass the acceptance tests i.e visual test, dimensional test porosity test, puncture test, temperature cycle test as per relevant ISS.

12.4 Following Type tests shall be conducted and test certificate duly signed by a responsible officer of the supplier's organization shall be submitted with the Bid.

1. Dry Power Frequency voltage withstand test.
2. Dry Power Frequency voltage flashover test.
3. Wet Power Frequency voltage withstand test.
4. Wet Power Frequency voltage flashover test.
5. High voltage impulse voltage withstand test.
6. High voltage 50% impulse voltage flashover test.
7. High voltage visible discharge test.
8. Electro mechanical failing load test.

12.5 Marking: Each insulator shall be legibly and indelibly marked with the following:

1) Name of trade mark of the manufacturer.
2) Month and year of manufacture.
3) ISI Certificate if any.

The marking shall be durable and shall be printed by the transfer process before firing. Stickers are not permitted.

The bidders can use insulators confirming to relevant ISS and having ISI Mark.

The successful bidder should get the insulator make approved by BESCOM, before making supplies.

13. NAME PLATE

Each DOLO cutout shall be provided with a Name plate of minimum size 100x40mm and shall be fixed with the following details which are legibly and indelibly marked.

1) Name of the material
2) Name of Manufacturer
3) BESCOM
4) Voltage Rating.
5) Purchase Order No. and Date
6) Sl.No.

14. SAMPLE

The successful bidder shall submit two samples and get them approved by the competent authority before taking up the manufacture. The two approved samples will be kept as under

i) One approved sample will be with the manufacturer at the manufacturing premises so that the inspecting officer can inspect the materials offered for inspection with reference to the approved sample.

ii) The second approved sample will be kept at BESCOM stores, Rajajinagar, Bangalore.

15. INSPECTION

All tests and inspection shall be made at the place of manufacture unless otherwise especially agreed upon by the manufacturer and the purchaser at the time to purchase. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge, to satisfy him that the material is being furnished in accordance with this specification. Purchaser and its representative shall at times be entitled to have access to the works and to all places of manufacture where insulators are manufactured and the supplier shall afford all facilities to them for unrestricted inspection of the works, inspection of materials and inspection of manufacturing process of insulators for conducting necessary tests and specified herein.

The supplier shall keep the Purchaser informed in advance of the time of starting and progress of manufacture of insulators in various stages so that arrangements could be made for inspection.

No material shall be dispatched from its point of manufacture unless the material has been satisfactorily inspected and tested.

The purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is dispute regarding the quality of supply.

16. TESTING

From the material offered for inspection, two samples shall be selected at random out of this one selected sample will be got tested at CPRI, Bangalore for the following tests at suppliers cost only.

1) Dielectric test for the complete unit;

2) Porosity test for the solid core insulator.

Incase the first sample fails in any of the above tests the second sample shall also be subjected to the above tests. In case even if the second sample also fails then BESCOM reserves the right to reject the entire lot.

General Manager (Ele),
QS&S, BESCOM